AMENDMENT AND RESPONSE
Serial Number: 09/316,515
Filing Date: May 21, 1999
Title: METHOD AND APPARATUS FOR TREATING IRREGULAR VENTRICULAR CONTRACTIONS SUCH AS DURING ATRIAL ARRHYTHMIA

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recent V-V interval duration and the previous value of the first indicated pacing interval, if the most recent V-V interval is concluded by an intrinsic beat; and

increasing the first indicated pacing interval, by an amount based [at least] on the most recent V-V interval duration and the previous value of the first indicated pacing interval, if the most recent V-V interval is concluded by a paced beat.

8.[Amended] The method of claim 6, wherein [in which] computing the first indicated pacing interval (T_n) includes [is carried] carrying out the computation according to: $T_n = A \cdot VV_n + B \cdot T_{n-1}$, if VV_n is concluded by an intrinsic beat, otherwise [is carried] carrying out the computation according to $T_n = C \cdot VV_n + D \cdot T_{n-1}$, if VV_n is concluded by a paced beat, where C and D are coefficients.

15.[Amended] The method of claim 12, wherein [in which] computing the first indicated pacing interval (T_n) includes [is carried] carrying out the computation according to: $T_n = a \cdot w \cdot VV_n + (1-w) \cdot T_{n-1}$, if VV_n is concluded by an intrinsic beat, otherwise [is carried] carrying out the computation according to $T_n = b \cdot w \cdot VV_n + (1-w) \cdot T_{n-1}$, if VV_n is concluded by a paced beat, where b is a coefficient.

26.[Amended] The method of claim 1, in which computing the first indicated pacing interval includes limiting the [minimum] first indicated pacing interval to be longer than or equal to an interval corresponding to an upper rate limit.

27.[Amended] The method of claim 1, in which computing the first indicated pacing interval includes limiting the [maximum] first indicated pacing interval to be shorter than or equal to an interval corresponding to a lower rate limit.

28.[Amended] A method, including:

detecting an atrial tachyarrhythmia;

obtaining V-V intervals between ventricular beats;

computing a first indicated pacing interval [based at least on] from a most recent V-V

interval duration and a previous value of the first indicated pacing interval; and

providing pacing therapy, based on the first indicated pacing interval, when the atrial

tachyarrhythmia is present.

29.[Amended] The method of claim 28, in which computing the first indicated pacing interval

includes:

adjusting the first indicated pacing interval, by an amount based [at least] on the most

recent V-V interval duration and the previous value of the first indicated pacing interval, if the

most recent V-V interval is concluded by an intrinsic beat; and

increasing the first indicated pacing interval, by an amount based [at least] on the most

recent V-V interval duration and the previous value of the first indicated pacing interval, if the

most recent V-V interval is concluded by a paced beat.

35.[Amended] The method of claim 33, wherein [in which] computing the first indicated pacing

interval (T_n) includes [is carried] carrying out the computation according to: $T_n = A \cdot VV_n + B \cdot T_{n-1}$,

if VV_n is concluded by an intrinsic beat, otherwise [is carried] carrying out the computation

according to $T_n = C \cdot VV_n + D \cdot T_{n-1}$, if VV_n is concluded by a paced beat, where C and D are

coefficients.

42.[Amended] The method of claim 39, wherein [in which] computing the first indicated pacing

interval (T_n) includes [is carried] carrying out the computation according to: $T_n = a \cdot w \cdot VV_n + (1-$

$w) \cdot T_{n-1}$, if VV_n is concluded by an intrinsic beat, otherwise [is carried] carrying out the

computation according to $T_n = b \cdot w \cdot VV_n + (1-w) \cdot T_{n-1}$, if VV_n is concluded by a paced beat, where b

is a coefficient.

53.[Amended] The method of claim 28, in which computing the first indicated pacing interval

includes limiting the [minimum] first indicated pacing interval to be longer than or equal to an

interval corresponding to an upper rate limit.

54.[Amended] The method of claim 28, in which computing the first indicated pacing interval includes limiting the [maximum] first indicated pacing interval to be shorter than or equal to an interval corresponding to a lower rate limit.

58.[Amended] A cardiac rhythm management system, including:

a ventricular sensing circuit for sensing ventricular beats;

a controller, obtaining V-V intervals between ventricular beats and computing a first indicated pacing interval [based at least on] from a most recent V-V interval duration and a previous value of the first indicated pacing interval; and

a ventricular therapy circuit, providing pacing therapy based on the first indicated pacing interval.

59.[Amended] The system of claim 58, in which the controller adjusts the first indicated pacing interval, by an amount based [at least] on the most recent V-V interval duration and the previous value of the first indicated pacing interval, if the most recent V-V interval is concluded by an intrinsic beat, and the controller increases the first indicated pacing interval, by an amount based [at least] on the most recent V-V interval duration and the previous value of the first indicated pacing interval, if the most recent V-V interval is concluded by a paced beat.

63.[Amended] A cardiac rhythm management system, including:

a ventricular sensing circuit;

a controller, the controller including:

a V-V interval timer;

a first register, for storing a first indicated pacing interval;

a filter, updating the first indicated pacing interval [based on] from the V-V interval timer and the first register; and

a ventricular therapy circuit, providing pacing therapy based at least partially on the first indicated pacing interval.

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67.[Amended] The system of claim 64, in which the filter includes an infinite impulse response (IIR) in updating the first indicated pacing interval based on the V-V interval timer and the first register.

68.[Amended] The system of claim 64, in which the filter includes a finite impulse response (FIR) in updating the first indicated pacing interval based on the V-V interval timer and the first register.

69.[Amended] The system of claim 64, in which the filter includes an averager in updating the first indicated pacing interval based on the V-V interval timer and the first register.

70.[Amended] The system of claim 69, in which the filter includes a weighted averager in updating the first indicated pacing interval based on the V-V interval timer and the first register.

73.[Amended] The system of claim 71, wherein [in which] the filter updates the first indicated pacing interval (T_n) according to the: $T_n = A \cdot VV_n + B \cdot T_{n-1}$, if VV_n is concluded by an intrinsic beat, otherwise the filter updates T_n [is updated] according to $T_n = C \cdot VV_n + D \cdot T_{n-1}$, if VV_n is concluded by a paced beat, where C and D are coefficients.

77.[Amended] The system of claim [73] 63, in which the filter updates the first indicated pacing interval (T_n) according to $T_n = a \cdot w \cdot VV_n + (1-w) \cdot T_{n-1}$, where a and w are coefficients, VV_n is the V-V interval duration provided by the V-V interval timer, and T_{n-1} is the previous value of the first indicated pacing interval.

80.[Amended] The system of claim 77, wherein [in which] the filter updates the first indicated pacing interval (T_n) according to the: $T_n = a \cdot w \cdot VV_n + (1-w) \cdot T_{n-1}$, if VV_n is concluded by an intrinsic beat, otherwise the filter updates T_n according to $T_n = b \cdot w \cdot VV_n + (1-w) \cdot T_{n-1}$, if VV_n is concluded by a paced beat, where b is a coefficient.